

CHAPTER 14

GEOTEXTILES

Introduction Prior to 1988 geotextiles were called plastic filter cloth or filter fabric. Because of the increase in the number of products being manufactured to be used as filter cloth, the specifications have been changed. The 1999 Specifications now label this material as "Geotextile". In the future geotextiles will be used in many different ways. But at this time only geotextile for use under riprap and with underdrains will be discussed.

Storage and Handling Storage and handling of geotextiles should be as per the manufacturer's recommendations. But INDOT also request that the geotextiles be protected from the following:

- * Direct sunlight
- * Ultraviolet rays
- * Water
- * Temperatures greater than 140 degrees Fahrenheit
- * Mud, dirt, and dust
- * Debris

Any of the above may affect the geotextiles':

- * strength
- * toughness
- * permeability

Exposure of geotextiles to the elements between lay down and covering should be a maximum of 14 days. At the time of installation, the geotextile should be rejected and replaced if:

- * defective
- * ripped
- * flawed
- * deteriorated
- * damaged

The material may be rejected if any of the above is incurred:

- * during construction
- * during manufacturing
- * during transportation
- * during storage

Placement The ground surface that receives the geotextiles should be prepared to a relatively smooth condition free of:

- * obstructions
- * depressions
- * debris

Geotextiles used along channels should be placed with the machine direction of the material parallel to the channel. If successive sheets are required they should be overlapped so that the upstream sheet is placed over the downstream sheet. If additional sheets are required to reach the top of the channel the upslope sheet should overlap the downslope sheet. If the channel's slopes are 2:1, the geotextile material should be placed as outline next.

Geotextiles used for 2 to 1 slopes or greater should be placed with the machine direction of the geotextile sheets perpendicular to the toe of the slope. The geotextile sheets should be overlapped in the direction of the anticipated movement of the water. For example on a foreslope the movement of the water will be from the pavement; therefore geotextile sheets should start at the bottom of the slope and proceed upslope.

Overlapping and Pinning

Adjacent pieces of geotextile may be joined by sewing or by overlapping. Most contractors prefer overlapping. When geotextile sheets are overlapped they must be pinned. The minimum overlap should be 18 inches. When the geotextiles are placed under water the minimum overlap should be 3 feet. If an overlap is periodically subject to being under water then this lap must be 3 feet.

The overlaps should be secured by pinning. The securing pins should be:

- * steel
- * 3/16 inch in diameter
- * 18 inches long
- * pointed at one end
- * fabricated with a head to retain a steel washer. The washers should have an outside diameter of at least 1 1/2 inches.

Securing pins should be inserted through both strips of overlapped geotextile. The pins should be placed through the midpoint of the overlap. The spacing intervals of the pins are determined by the slopes the geotextile is being placed on. The following table shows desired spacing:

SLOPE	PIN SPACING
(Horizontal;Vertical)	PER ROW (Center:Center)
steeper than 3 to 1	2 ft.
3:1 to 4:1	3 ft.
4:1 or flatter	5 ft.

The pins should be driven until the washer bears against the geotextile. The geotextile should be secured firmly

to the ground. Additional pins should be installed as necessary to prevent any slippage of the fabric regardless of location.

Underdrains The geotextiles for underdrains should be inspected and handled just like the geotextiles for riprap. The overlap for geotextiles for underdrains is 1 foot. The upstream geotextiles should always overlap the downstream geotextiles. As soon as the geotextiles for the underdrains is placed it needs to be backfilled with the aggregate for underdrains.

Placement The geotextile should be placed such that placement of the overlaying materials will not:

- * excessively stretch the geotextile
- * tear the geotextile
- * pull overlap or seam apart

The following do's and don'ts should also be observed by the Technician:

- * Construction equipment should not be allowed on the exposed geotextile.
- * Placement of riprap or stone should start at the base of the slope moving upward and from the center outward.
- * Riprap should not be allowed to roll downslope.
- * The height drop for riprap should be less than one foot.

Acceptance of Materials The geotextile for under riprap must meet the requirements of specification 913.18 (Riprap) and 913.19 (Underdrains). Geotextiles are on an "Approved List". If the geotextile being used appears on that list then it is acceptable to be used. There are times when the geotextiles will need to be sampled. Your Project Supervisor/Engineer will instruct you when that is necessary. You need to keep the PS/PE informed of all material that comes on the job.

Measurement and Payment Geotextiles will be measured in place. The accepted quantities should be in square yards. It is the responsibility of Technician to know how to measure geotextiles. The payment for geotextiles will be as per the contract unit. This is normally per square yard. The unit price includes excavation, grading, sewing, pinning and all other incidentals needed to complete the work.